TAITO AMERICA CORPORATION

CONVERSION KIT

FOR

PIT & RUN®

universal kit

72-10025-001

TABLE OF CONTENTS

LIST OF FIGURES

This manual will guide you in the conversion of your raster scan, color monitor upright video game into a PIT & RUN game. We urge you to read through the instructions and study the drawings before beginning the conversion. Perform the instruction steps in the order presented.

1. Check the parts supplied in this kit against the parts list in the manual.

2. Cabinet preparation.

   a. Remove the exsisting logic boards from cabinet.

   b. PIT & RUN requires a vertically mounted monitor. Remount monitor in the best possible way if it was horizontally mounted. Note: PIT & RUN generates composite negative sync.

   c. To insure compliance with FCC regulations, the power supply used for PIT & RUN must meet these requirements:

      A line filter must be installed between the power supply and the AC line. Taito recommends a Corcom model #6S1 or equivelent. Taito part no. #22-00001-001

      A single point ground must be maintained thoughout the game, i.e, the chassis for the power supply, the monitor chassis and the ground plate for the PCB set must be connected to the green "earth ground" wire in the Ac line cord.

      The power supply must meet or exceed the voltage and current requirements.

      +5 volts @ 4 amps   +12 volts @ 1 amp

   d. PIT & RUN requires a speaker with a nominal impedance of 4 ohms or greater.

3. Install Ground Plate, filter board and PCB.

   a. Locate the the Ground Plate on a cabinet wall. Experiment to determine the best orientation for the plate remembering that the game PCB set must be able to slide into the card guides. Mount the plate to the cabinet using a 8x11/16 screw in each corner. Using the holes in the plate as a template, screw the two PCB mounting brackets into the cabinet using the 8 x11/16" screws provided. Be carefull not to bow or bend the ground plate. It must lay flat against the mounting surface.SEE FIGURE 1.

   b. Depending on the installation, the PCB set may have to be slid into place before the filter board is mounted. If this is the case, slide the PCB set into place before mounting the filter board.

c. Using the holes in the plate as a template, screw the filter board into the cabinet using the 6 x 1 1/2" screws provided. SEE FIG. 1.

d. Slide the PCB set into the guides with the edge connector facing the filter board and the component sides of the PCB set facing outward. Push the PCB set edge connector GENTLY into the connector on the filter board. Be sure the connectors on the PCB and filter board are aligned properly.SEE FIGURE 1.

e. Mount the "L" bracket into the cabinet, using a 6 x 1/2" screw provided, on the left side of the PCB to keep it from sliding. SEE FIGURE 1.

4. Connect the main harness.

a. Connect the 44 pin edge connector of the main harness to the filter board, observing the keying plug. SEE FIGURE 1.

b. Connect the 12 pin connector of the main harness to the filter board. Connnect the "power jumper" cable between the filter board and the PCB set.

c. Using the supplied wiring diagram as a guide, connect the main harness ends to the correct power supply, coin door and speaker connections. Note: The coin door bundle of wires contains an orange wire to be connected to a tilt switch. To enable the tilt feature, cut the J5 jumper on the center board of the Pit & Run PCB set. Connect a NORMALLY CLOSED switch between ground and the orange wire. If the tilt feature is not desired, then DO NOT cut the J5 jumper and tie the orange wire out of the way.

d. Connect the gray video cable to the monitor. The connectors will mate with most Wells Gardner and Electrohome monitors. If using a different monitor, use the wiring diagram as a guide in wiring the video cable to the monitor.

5. Rework control panel.

a. Strip the control panel of all buttons and/or joysticks.

b. Locate and drill the holes needed for the joystick and buttons. Use template supplied with kits to locate holes for the joystick. Clean any burrs from around holes.

c. Remove any soil and/or grime from the front of the panel.

d. Cut the lexan to the approximate size needed to cover the panel. If possible, leave enough lexan to wrap a small lip around the top and bottom of the panel.

e. Peel the backing off the lexan and apply it to the control panel. Cut out the lexan from the holes needed for the joystick and buttons.

f. Install joystick, buttons and any hardware that might have been removed on the panel.

g. Using the supplied wiring diagram as a guide, connect the joystick and buttons to the main harness. Note: A section of black wire is supplied with the kit for jumpering grounds between the push buttons and joystick switches.

h. Mount the control panel back on the cabinet.

6. Install marquee overlay.

a. Remove marquee and clean soil and grime off.

b. Cut the marquee overlay to approximately the size needed.

c. Peel the backing off the overlay and apply the overlay to the marquee. Trim excess overlay off with a sharp knife or razor blade.

d. Replace the marquee back on the cabinet.

7. Install Ground Braids.

a. Connect one end of a 28 inch ground braid to the Ground Plate at a convenient corner with a screw. Connect the other end of the ground braid to a convenient point on the the power supply chassis ground.

b. Connect another 28 inch ground braid from a convenient point on the power supply ground chassis to a convenient point on the monitor chassis.

8. Game Adjustments

a. Consult the PIT & RUN Switch setting card and adjust the DIP switches as desired. Attach this card to the rear door of the game for future reference.

b. Turn the game ON and play a "2-PLAYER" test game. Adjust the volume controls as desired.

c. Some adjustments may have to be made to the horizontal and vertical frequency controls on the monitor. Some centering and width adjustments may also have to be made.

9. Attach FCC compliance and FBI warning labels.

Affix the FCC compliance and FBI warning labels to the back of the cabinet.

10. Attach the Instruction card.

Affix the instruction card to a convenient location on the coverglass.

The conversion is complete.

PIT & RUN CONVERSION PARTS LIST

CONVERSION KIT

DESCRIPTION	QUANTITY	PART NUMBER
PCB set	1	08-00146-001
Filter Board	1	08-00147-001
Ground plate	1	61-00361-001
Marquee overlay, PNR	1	66-00018-001
Control panel overlay	1	66-00005-001
Main Harness	1	09-00317-001

MANUAL PACK

DESCRIPTION	QUANTITY	PART NUMBER
Switch Setting Card	1	79-00105-001
Instruction card	1	79-50040-001
Conversion manual	1	72-10025-001
FCC Compliance Label	1	79-00070-001
FBI Warning label	1	79-00074-001

CONTROL PANEL PACK

DESCRIPTION	QUANTITY	PART NUMBER
"Accelerate" button	2	63-00156-006
1 player button	1	63-00176-001
2 player button	1	63-00176-002
P.B. Switch	4	29-00020-001
Stamped nut	4	54-07001-008
Ball and Shaft	1	63-00031-002
Mask	1	63-00033-001
E ring	1	59-00020-017
4 way leaf switch	1	63-00032-004
4 way actuator	1	63-00030-002
#10x24 carriage bolt	4	51-03004-013
#10x24 keps nut	4	54-02004-001

PARTS PACK

DESCRIPTION	QUANTITY	PART NUMBER
Braided Cable, 28"	2	09-00260-003
PCB mtg. bracket	2	07-00364-001
Power jumper cable	1	09-00318-001
Screw #8x11/16	10	51-00005-001
Screw #6x1 1/2"	4	51-01012-015
"L" bracket	1	61-00014-001
Screw #6x1/2"	1	51-01012-006
Black wire	5'	28-00009-000
Tye wraps	10	59-00003-001

FIGURE 1

PIT & RUN KIT - PCB & FILTER BOARD

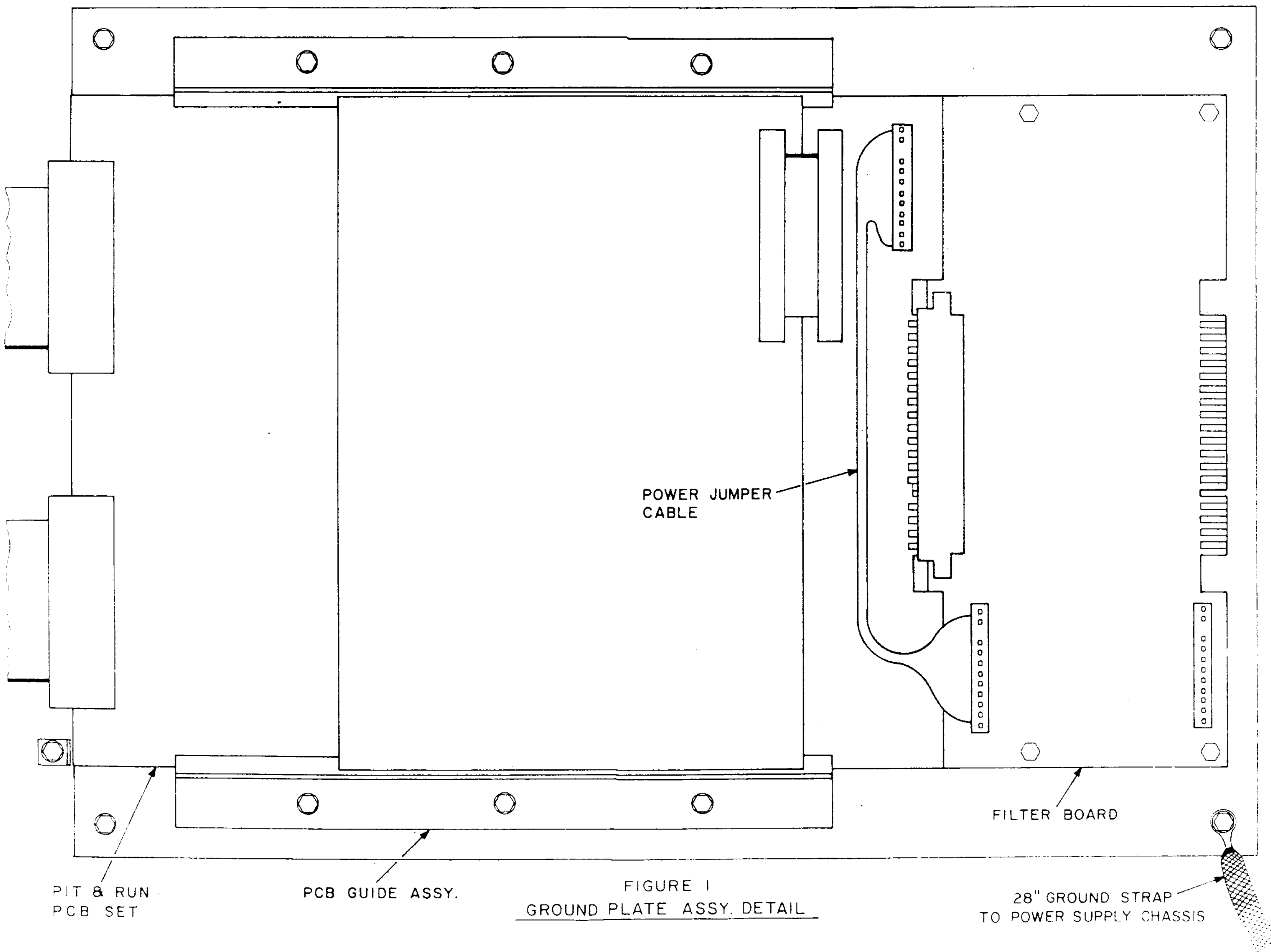
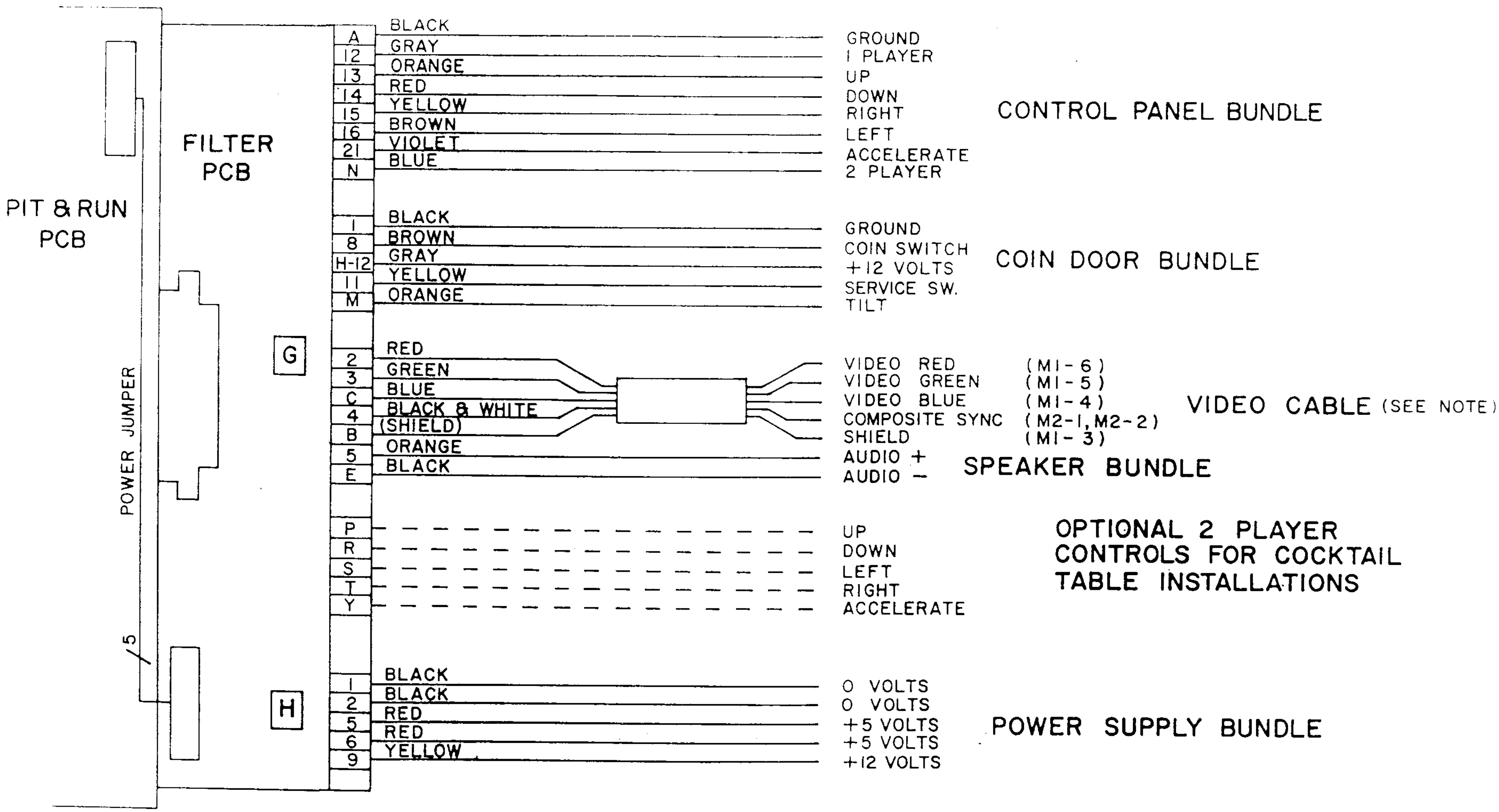


FIGURE I
GROUND PLATE ASSY. DETAIL

FIGURE 2

PIT & RUN - WIRING DIAGRAM

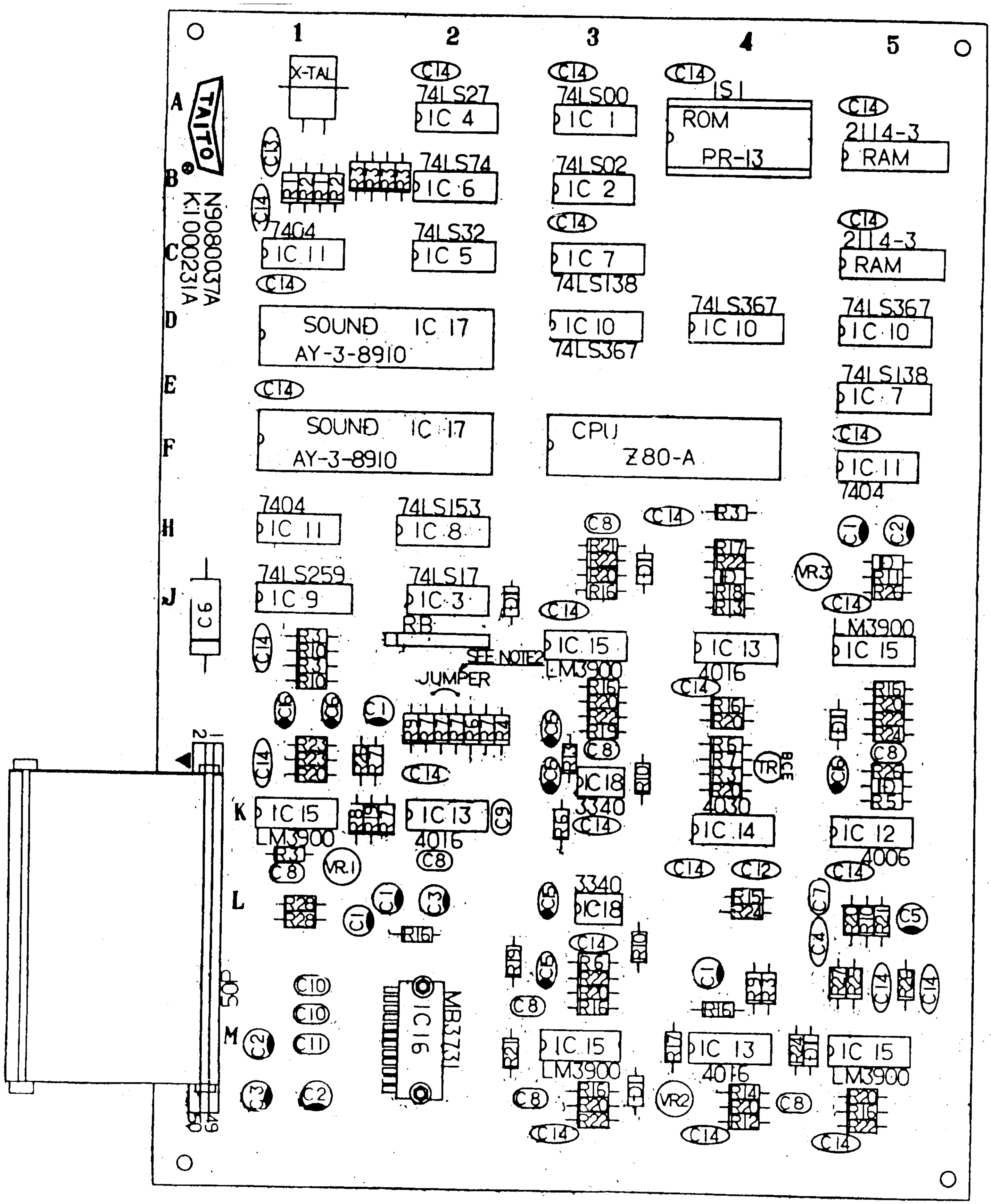


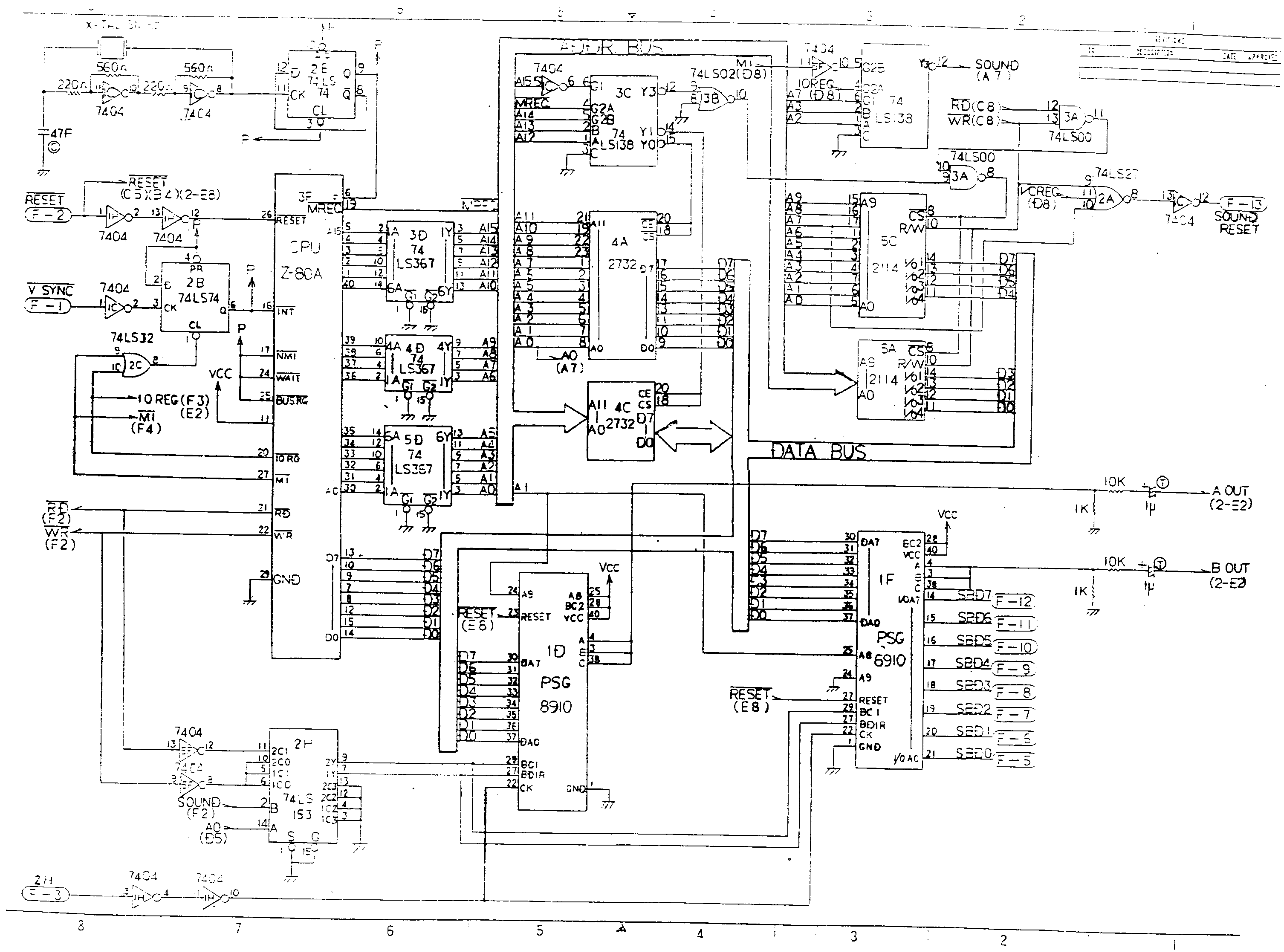
NOTE: M1 AND M2 CONNECTORS MATE WITH WELLS-GARDNER, ELECTROHOME AND EQUIVALENT MONITORS.

ADDITIONAL NOTES:
On some kits, the coin switch wire is RED instead of BROWN as shown in the wiring diagram.

When adjusting the power supply for +5 and +12 volts, measure voltages AT THE PCB SET.

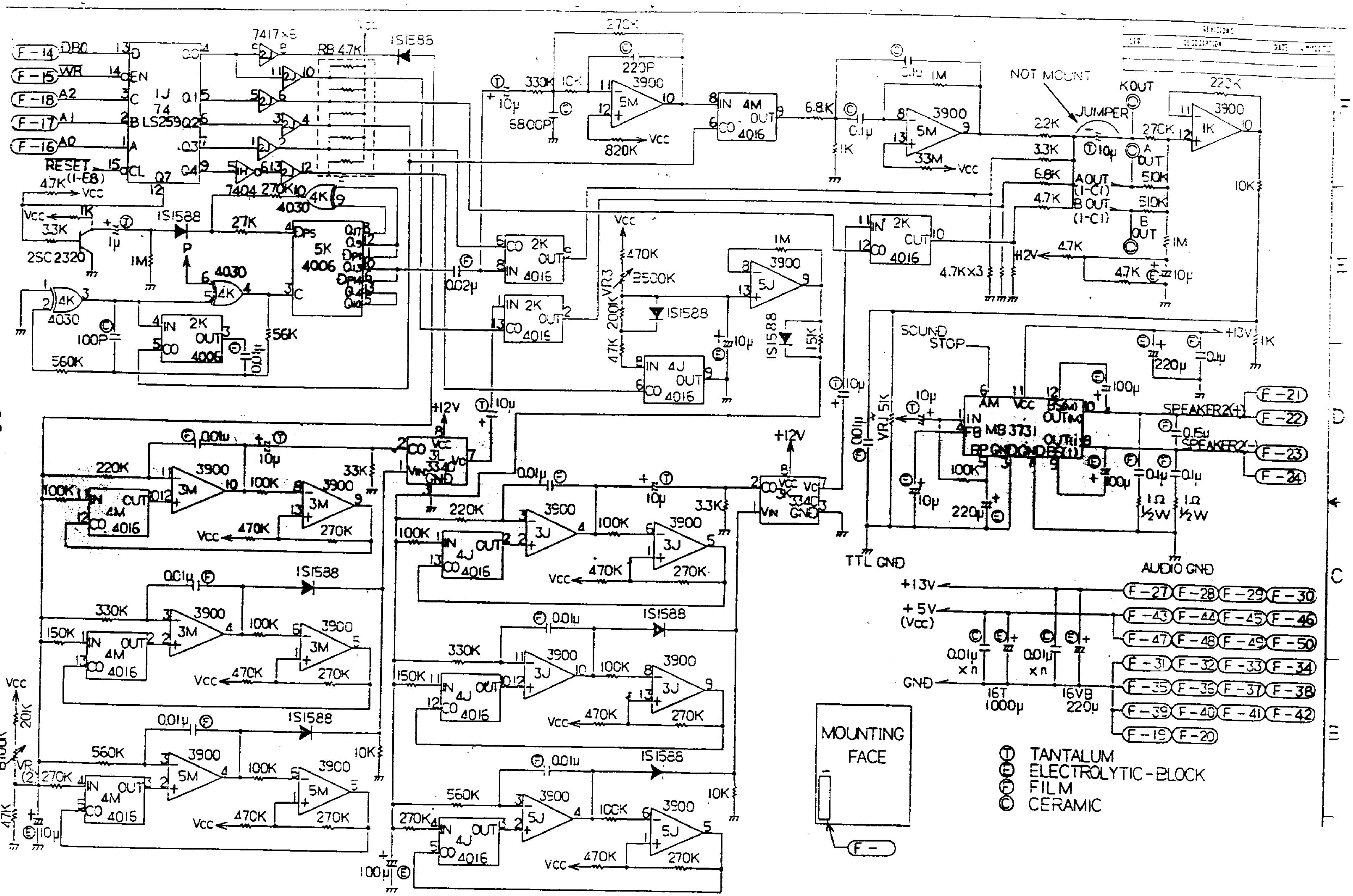
SOUND BOARD LAYOUT





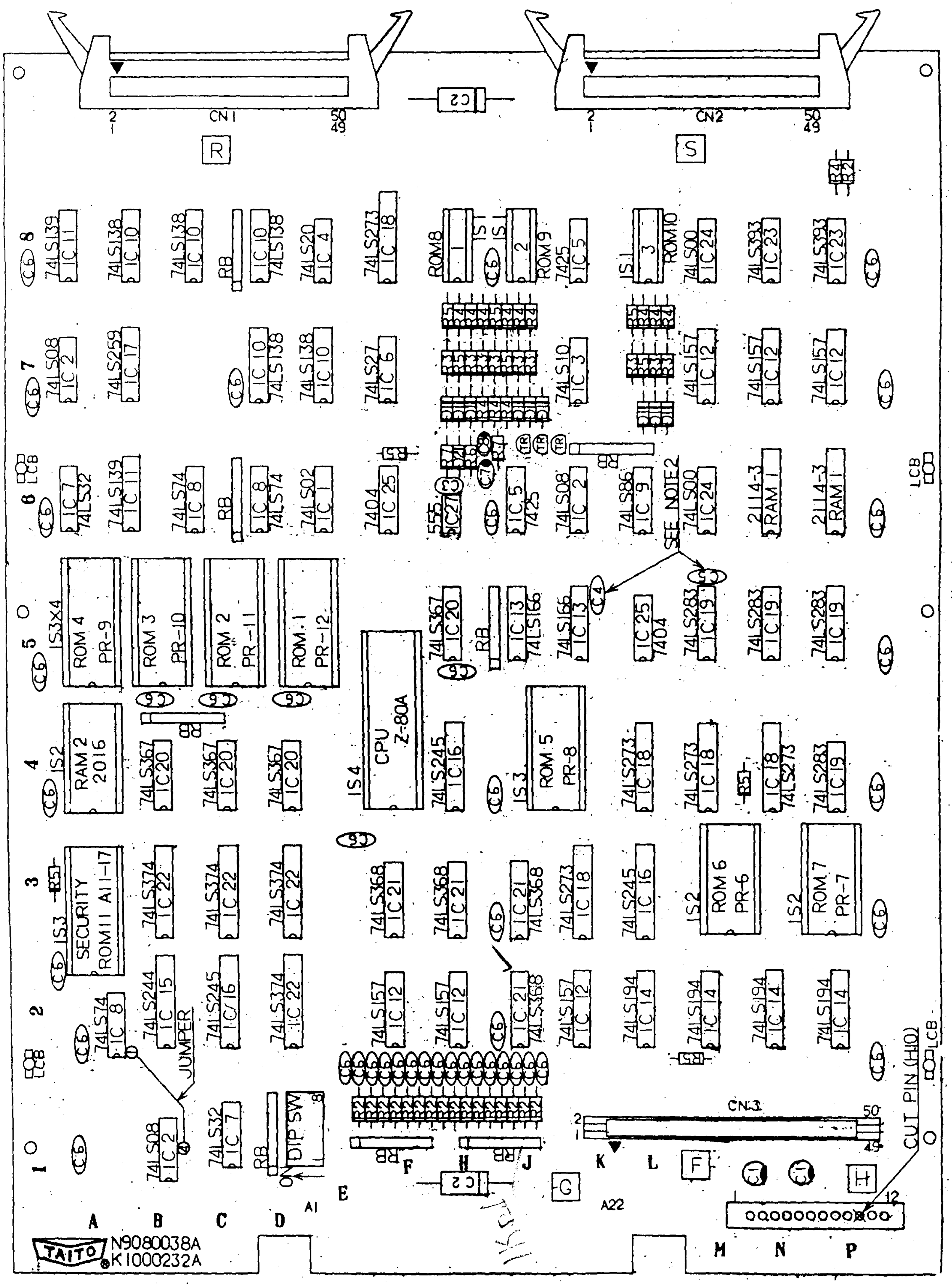
SOUND BOARD 1/2

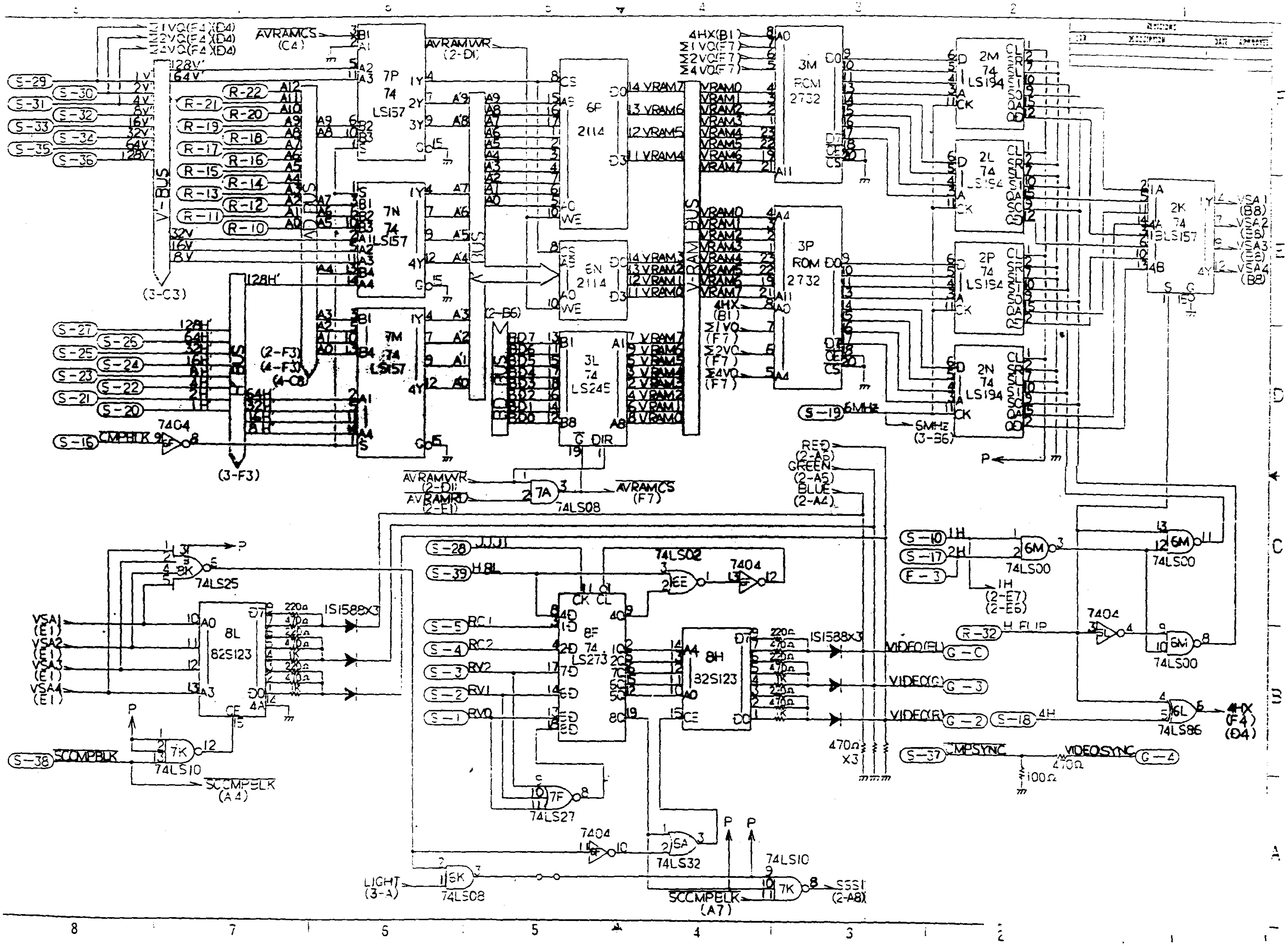
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SOUND BOARD 2/2

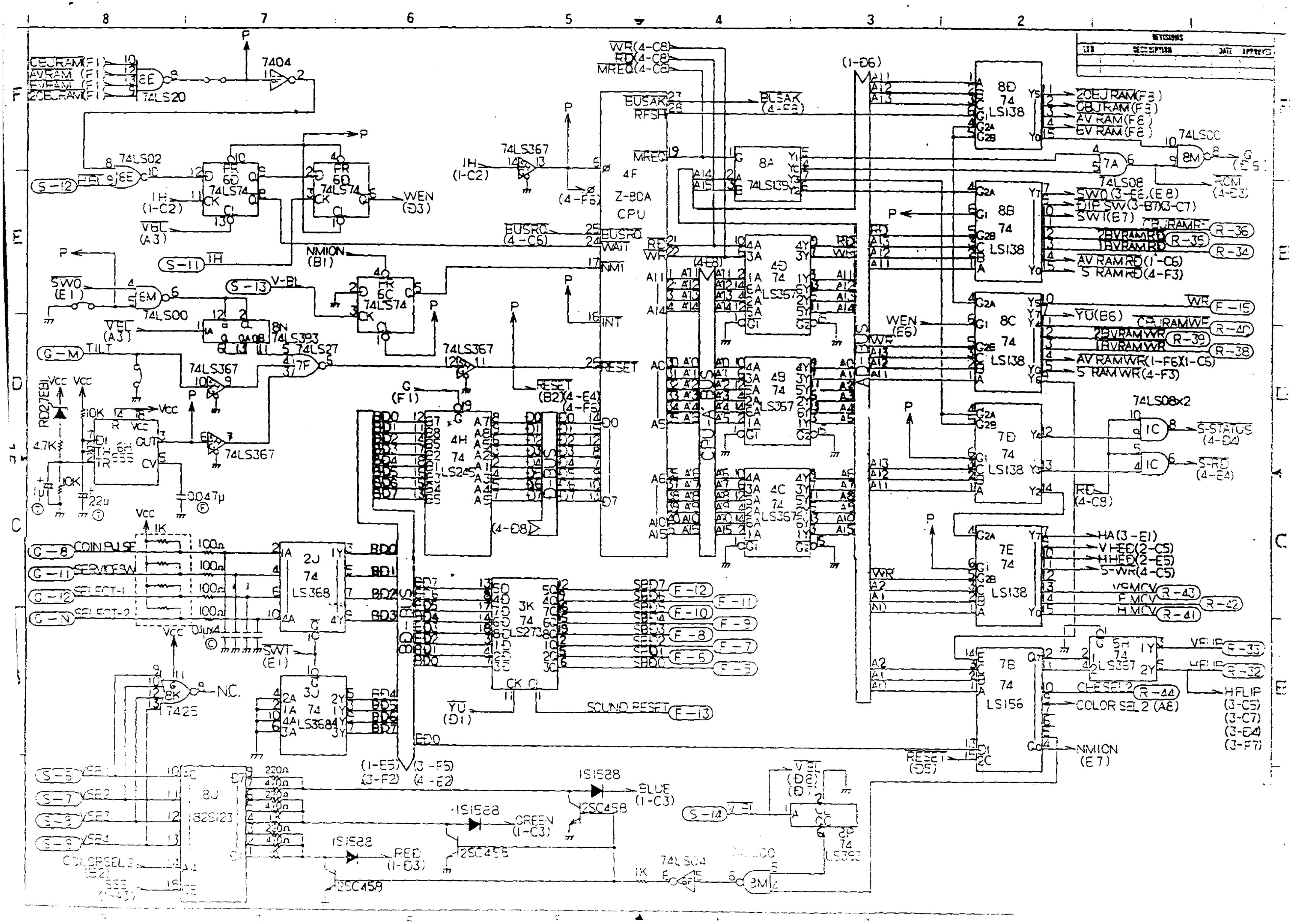
CPU BOARD LAYOUT



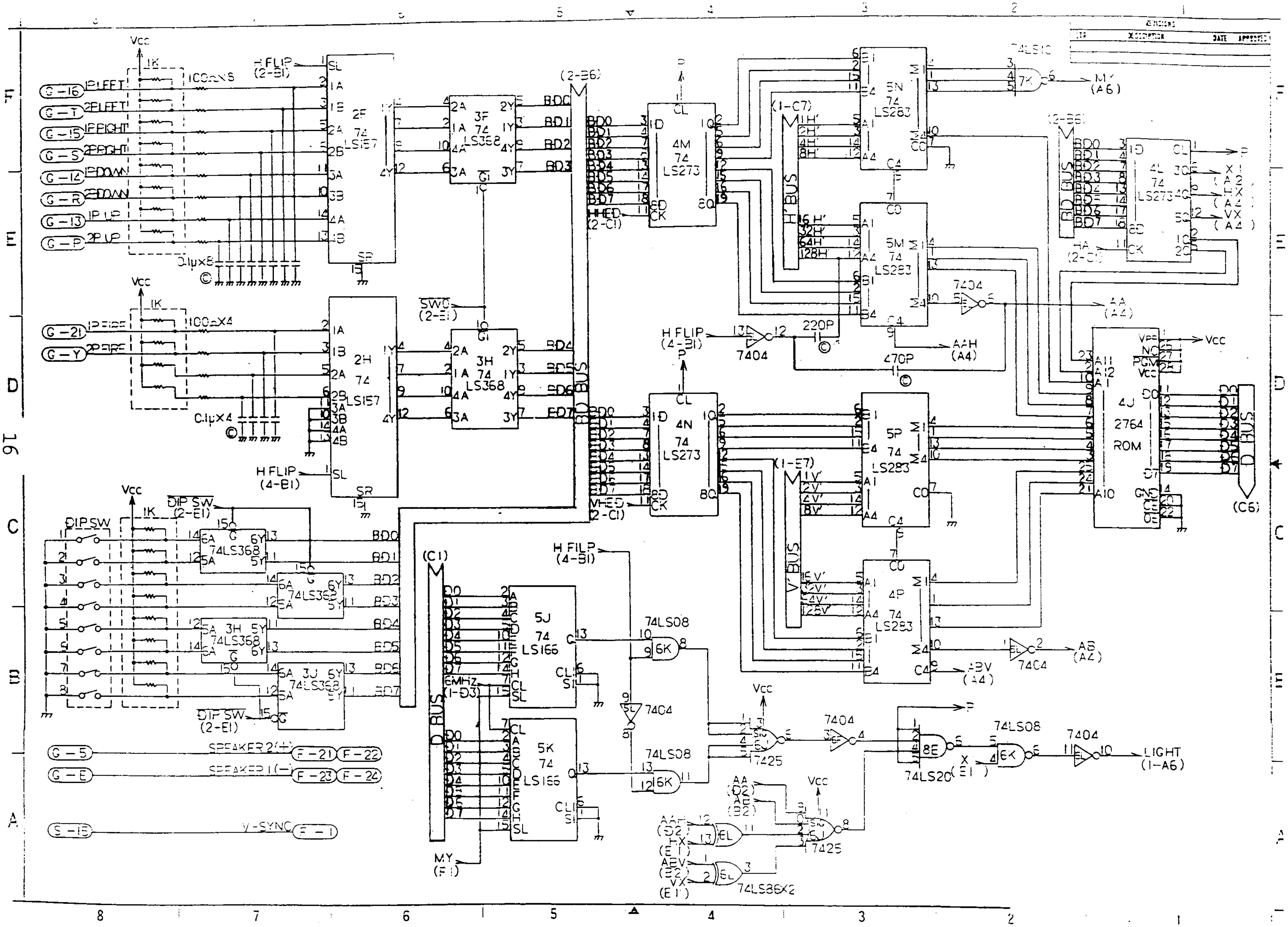


V-BUS
H-BUS
V-RAM BUS
7P 74 LS157
7N 74 LS157
7M 74 LS157
6P 2114
6N 2114
3L 74 LS245
3M ROM 2732
3P ROM 2732
2M 74 LS194
2L 74 LS194
2P 74 LS194
2N 74 LS194
2K 74 LS157
8L 82S123
8F 74 LS273
8H 82S123
AVRAMCS
AVRAMWR
AVRAMRD
74LS08
74LS25
74LS10
74LS02
7404
74LS27
74LS32
74LS00
74LS86
1S1588X3
VIDEO(B)
VIDEO(G)
VIDEO(R)
VIDEO SYNC
CMPSYNC
SCOMPBLK
CMPBLK
H FLIP
6MHz
LIGHT
RED
GREEN
BLUE

CPU BOARD 1/4

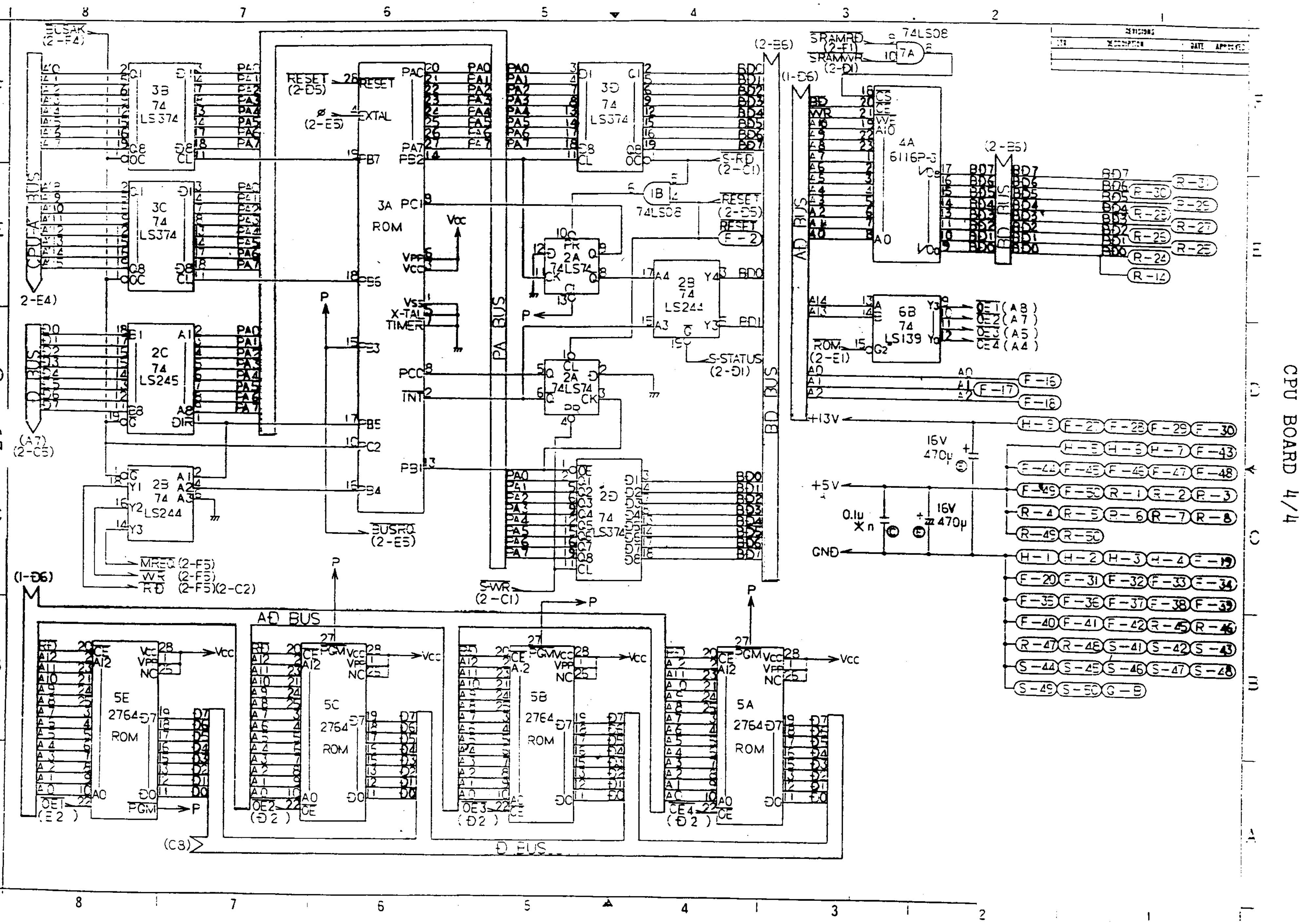

Z-80A
CPU
4F
74LS20
7404
74LS02
74LS74
74LS00
74LS393
74LS27
74LS367
555
74LS245
74LS368
74LS273
7425
82S123
74LS139
74LS138
74LS08
74LS156
74LS04
1S1588
2SC458
BLUE (1-C3)
GREEN (1-C3)
RED (1-D3)
COIN PULSE
SERVICE SW
SELECT-1
SELECT-2
SOUND RESET
NMION
HFLIP
VFLIP
WEN
RESET
CPU-ADDRESS
D-BUS
BD-BUS

CPU BOARD 2/4

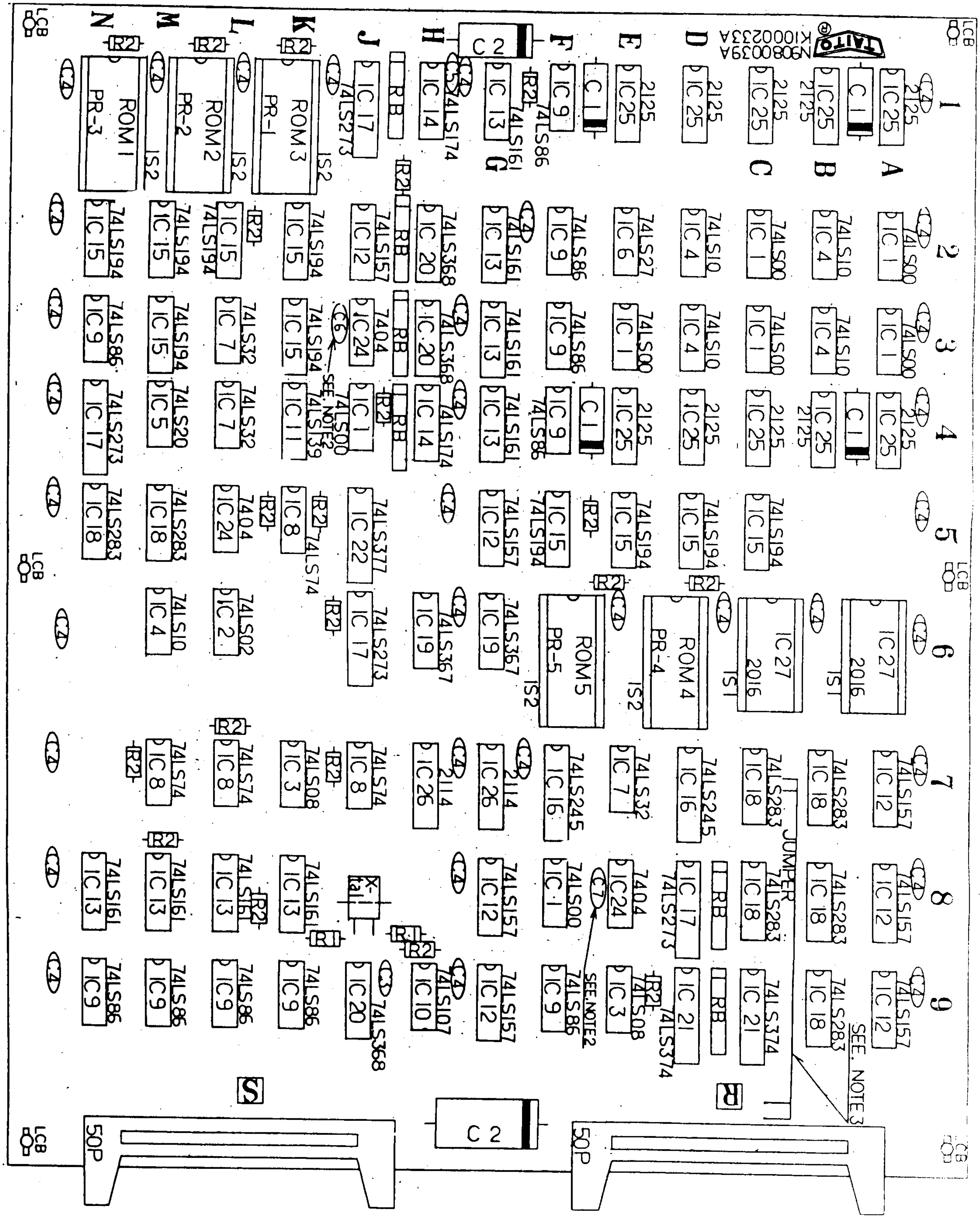


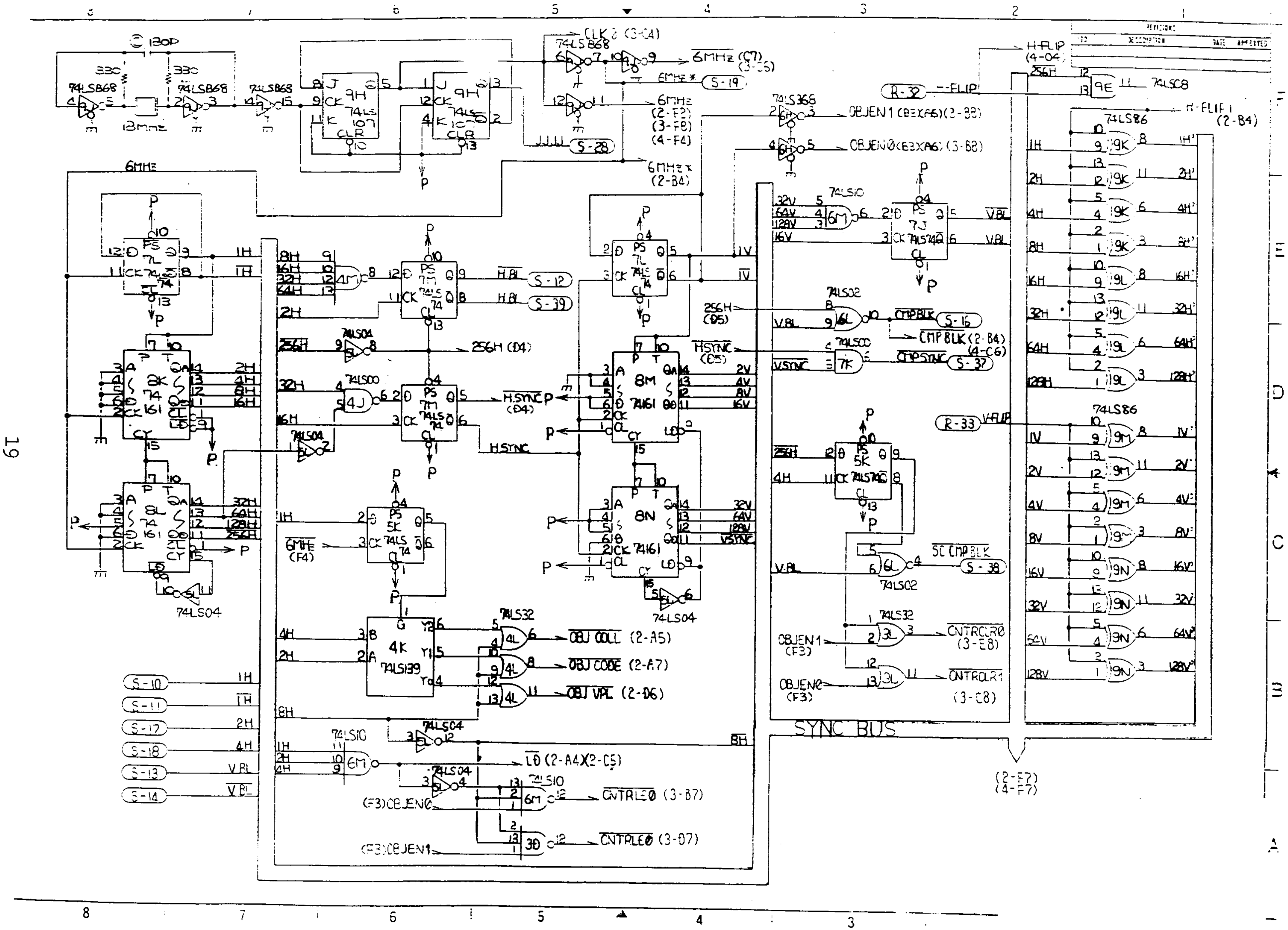
74LS157
74LS368
74LS273
74LS283
74LS166
2764 ROM
74LS08
7404
7425
74LS20
74LS86X2
D BUS
BD BUS
H' BUS
V' BUS
SPEAKER 2(+)
SPEAKER 1(-)
V-SYNC
LIGHT (1-A6)
DIP SW

CPU BOARD 3/4


CPU BOARD 4/4
3B 74 LS374
3C 74 LS374
2C 74 LS245
2B 74 LS244
3A ROM
3D 74 LS374
1B 74LS08
2A 74LS74
2B 74 LS244
2D 74 LS374
74LS08 7A
4A 6116P-3
6B 74 LS139
5E 2764 ROM
5C 2764 ROM
5B 2764 ROM
5A 2764 ROM
CPU-A BUS
D BUS
PA BUS
BD BUS
AD BUS
BD BUS
RESET (2-D5)
EXTAL
BUSRQ (2-E5)
MREQ (2-F5)
WR (2-F5)
RD (2-F5)(2-C2)
S-RD (2-C1)
RESET (2-D5)
S-STATUS (2-D1)
S-WR (2-C1)
SRAMRD (2-E1)
SRAMWR (2-D1)
ROM (2-E1)
OE1 (A8)
OE2 (A7)
OE3 (A5)
CE4 (A4)
+13V
+5V
GND
16V 470μ
0.1μ
16V 470μ

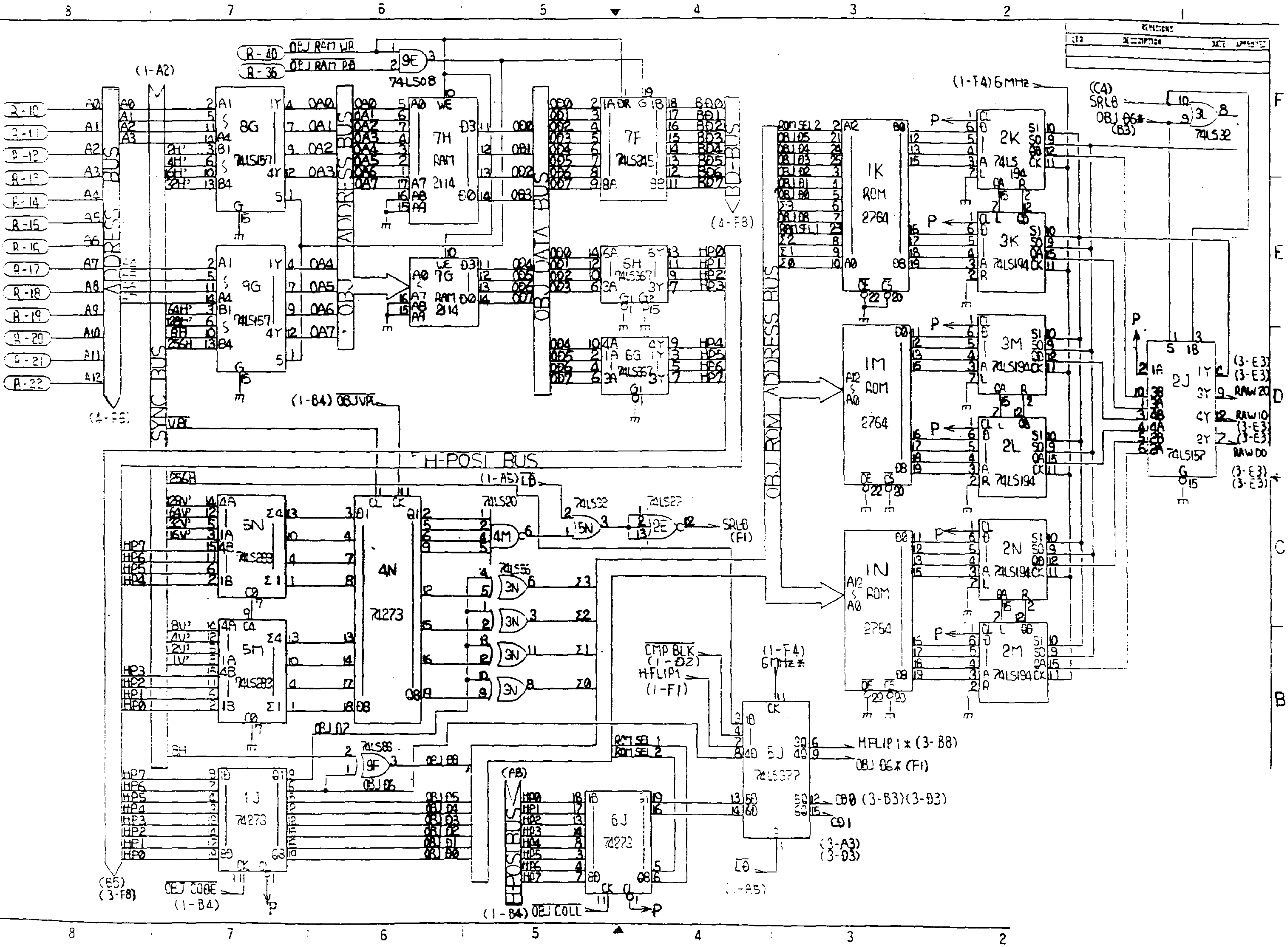
VIDEO BOARD LAYOUT



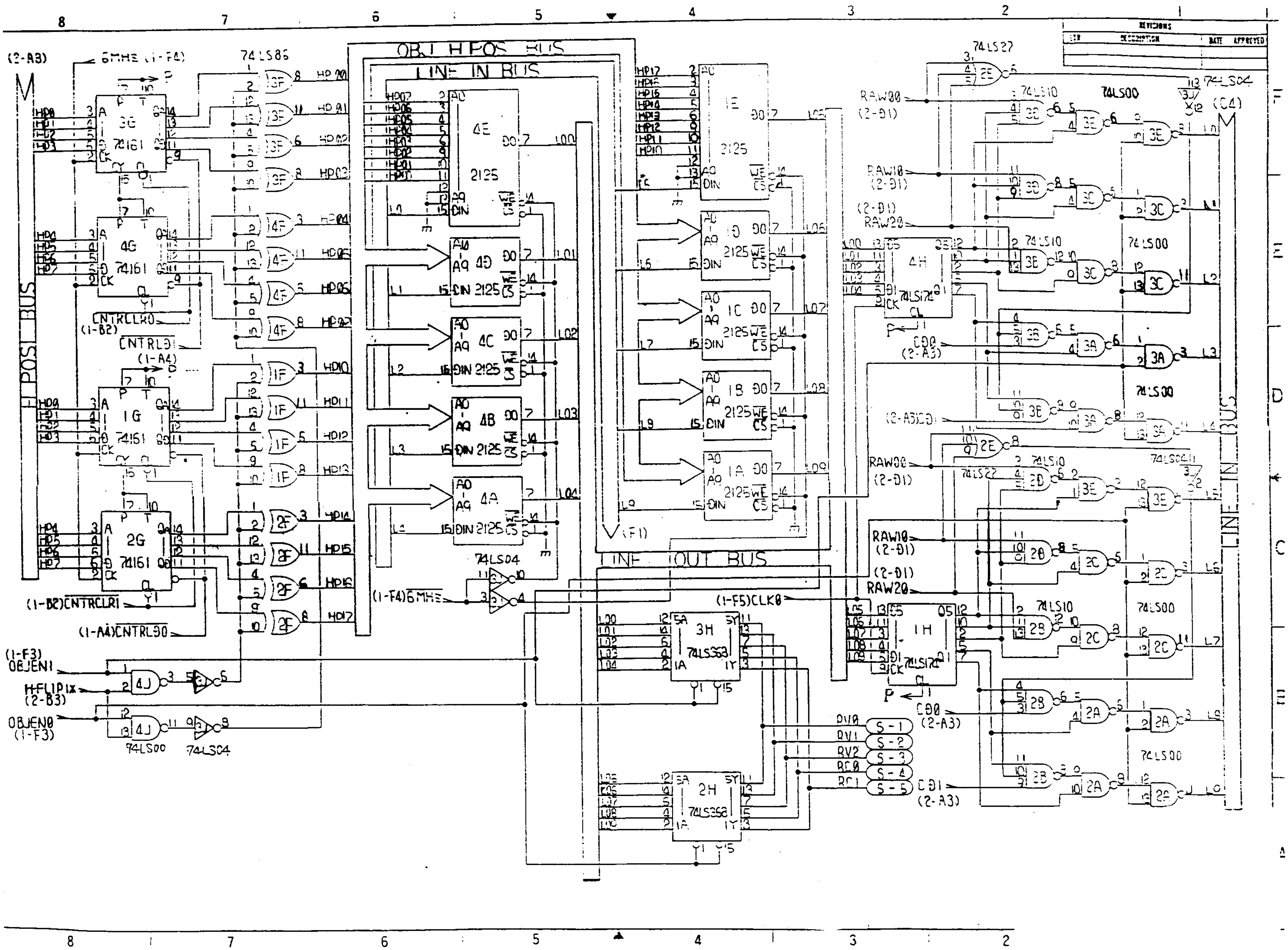


VIDEO BOARD 1/4

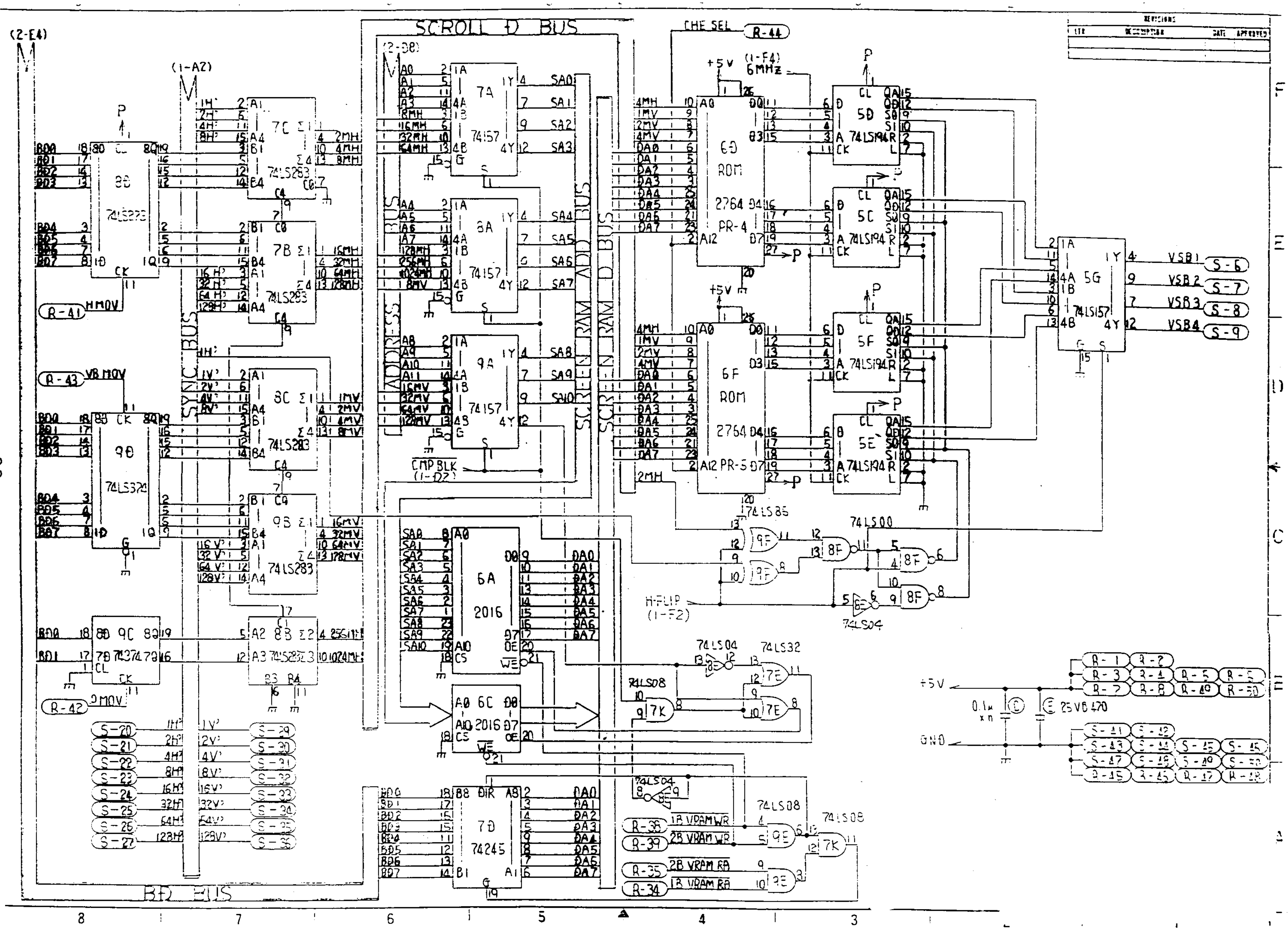
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VIDEO BOARD 2/4



VIDEO BOARD 3/4


SCROLL D BUS
CHR SEL
R-44
(2-E4)
(1-A2)
(2-D8)
(1-F4) 6MHz
+5V
8B 74LS273
9B 74LS273
7C 74LS283
7B 74LS283
8C 74LS283
9B 74LS283
8B 74LS283
9C 74LS74
7A 74157
6A 74157
9A 74157
6D ROM 2764 PR-4
6F ROM 2764 PR-5
5D 74LS194
5C 74LS194
5F 74LS194
5E 74LS194
5G 74LS157
6A 2016
6C 2016
7D 74245
SYNC BUS
ADDRESS BUS
SCREEN RAM D BUS
SCREEN RAM ADD BUS
BD BUS
R-41 HMOV
R-43 VB MOV
R-42 9 MOV
CMP BLK (1-D2)
H-FLIP (1-F2)
74LS86
74LS00
74LS04
74LS32
74LS08
VSB1 S-6
VSB2 S-7
VSB3 S-8
VSB4 S-9
R-38 1B VRAM WR
R-39 2B VRAM WR
R-35 2B VRAM RD
R-34 1B VRAM RD
+5V
GND
0.1μ x n
25V B 470